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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/389,904 | 09/03/1999 | PHILIP D. WRATCHFORD | P-5531 | 6016 |

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EXAMINER

DO, AN H

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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2853

DATE MAILED: 02/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/389,904

Applicant(s)

WRATCHFORD, PHILIP D.

Examiner

An H. Do

Art Unit

2853

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 12, 16-20 and 29-37 is/are rejected.
- 7) ☒ Claim(s) 6-11, 13-15, 21-28, 38 and 39 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The Amendment filed on 13 November 2003 has been acknowledged.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 2 and 33-37 are rejected under 35 U.S.C. 102(b) as being anticipated by Suzuki et al (JP 404336256 A).

Regarding claims 1 and 2, Suzuki et al discloses in Figure 2 an apparatus of an ink jet print head comprising a plurality of ink channels (spaces between the ink heater 14) disposed in a common plane, each of the channels having at least one orifice (12) for projecting ink towards a substrate; and an ink heater (14) made of a positive temperature coefficient (PTC) thermistor material (Abstract), the ink heater (14) having a substantially planar configuration and extending in a plane generally parallel to the plane of the ink channels and adjacent to the ink channels (Figure 2).

Regarding claims 33-35, Suzuki et al discloses in Figure 2 a method of thermally tuning an ink heater (14) for an ink jet print head comprising the steps of forming the ink heater (14) using a PTC thermistor material (Abstract); and attaching a plurality of electrodes (13a, 13b) to the ink heater (14).

Regarding claims 36 and 37, Suzuki et al discloses in Figure 2 a method of maintaining the ink in an ink jet print head at a uniform temperature wherein the ink jet

print head has a plurality of ink channels (spaces between the ink heater 14) generally disposed in a common plane, the method comprising the step of using a planar ink heater (14) generally parallel to said common plane and made of a PTC thermistor material (Abstract).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al (JP 404336256 A) in view of Hori et al (US 4,716,279).

Suzuki et al discloses the claimed invention except for reciting an ink heater made of a ceramic thermistor material; and first and second electrodes extending on one side of the thermistor.

Hori et al teaches the ink heater made of a ceramic thermistor material; and teaches in Figure 6 the first and second electrodes (7, 8) extending on one side of the thermistor.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the ink heater made of a ceramic thermistor material and the electrodes extending on one side of the thermistor, as taught by Hori et al, for the purpose of obtaining and controlling varied temperature as noted in column 1, lines 7-15 of Hori et al.

5. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al (JP 404336256 A) in view of Hori et al (US 4,716,279) as applied to claims 3-5 above, and further in view of Fujii et al (US 6,371,598 B1).

Suzuki et al in view of Hori et al discloses the claimed invention except for reciting a top body portion; an intermediate body portion having an upper side and a lower side, a plurality of ink channels disposed in a common plane along the upper side, each of the channels having at least one orifice for projecting ink towards a substrate, the upper side of the intermediate body portion located adjacent the top portion; and a main body portion located adjacent the lower side of the intermediate body portion.

Fujii et al teaches in Figures 1 and 3 a top body portion (3); an intermediate body portion (1) having an upper side and a lower side, a plurality of ink channels (6) disposed in a common plane along the upper side, each of the channels (6) having at least one orifice (4) for projecting ink towards a substrate (105), the upper side of the intermediate body portion (1) located adjacent the top portion (3); and a main body portion (2) located adjacent the lower side of the intermediate body portion (1).

It would have been further obvious to one having ordinary skill in the art at the time the invention was made to include a top portion, an intermediate portion and a main body portion, as taught by Fujii et al, for the purpose of obtaining a desired structure of a printhead.

6. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii et al (US 6,371,598 B1) in view of Suzuki et al (JP 404336256 A).

Fujii et al discloses in Figures 1 and 3 an ink jet print head (10) comprising a top body portion (3); an intermediate body portion (1) having an upper side and a lower side, a plurality of ink channels (6) disposed in a common plane along the upper side, each of the channels (6) having at least one orifice (4) for projecting ink towards a substrate (105), the upper side of the intermediate body portion (1) located adjacent the top portion (3); and a main body portion (2) located adjacent the lower side of the intermediate body portion (1).

Fujii et al discloses the claimed invention except for reciting an ink heater made of a thermistor material, the ink heater having a substantially planar configuration and is located between the lower side of the intermediate body portion and the main body portion, and extending in a plane generally parallel to the plane of the ink channels and adjacent to the ink channels.

Suzuki et al teaches in Figure 2 an ink heater made of a thermistor material (PTC), the ink heater having a substantially planar configuration and is located between the lower side of the intermediate body portion (1) and the main body portion (17), and extending in a plane generally parallel to the plane of the ink channels and adjacent to the ink channels.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the ink heater made of a PTC thermistor material, the ink heater having a substantially planar configuration and is located between the lower side of the intermediate body portion and the main body portion, and extending in a plane generally parallel to the plane of the ink channels and adjacent to the ink channels as

taught by Suzuki et al, for the purpose of maintaining the constant temperature of the ink in the cavity as noted in the Abstract of Suzuki et al.

7. Claims 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii et al (US 6,371,598 B1) in view of Suzuki et al (JP 404336256 A) as applied to claims 16 and 17 above, and further in view of Hori et al (US 4,716,279).

Fujii et al in view of Suzuki et al discloses the claimed invention except for reciting an ink heater made of a ceramic thermistor material; and first and second electrodes extending on one side of the thermistor.

Hori et al teaches the ink heater made of a ceramic thermistor material; and teaches in Figure 6 the first and second electrodes (7, 8) extending on one side of the thermistor.

It would have been further obvious to one having ordinary skill in the art at the time the invention was made to have the ink heater made of a ceramic thermistor material and the electrodes extending on one side of the thermistor, as taught by Hori et al, for the purpose of obtaining and controlling varied temperature as noted in column 1, lines 7-15 of Hori et al.

8. Claims 29-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al (JP 404336256 A) in view of Fujii et al (US 6,371,598 B1).

Suzuki et al discloses in Figure 2 a method for tuning a thermistor (14) for heating ink in an ink jet head comprising: a planar member (14) made of thermistor material having a positive temperature coefficient (PTC) (Abstract); a first edge opposite from a second edge, the first electrode extending along the first edge and the second

electrode extending along the second edge; wherein the first and second electrodes (13a, 13b) are opposite from one another and substantially parallel; The electrodes (13a, 13b) formed in a pattern and also include means (Abstract) for thermally tuning the thermistor (14).

Suzuki et al discloses the claimed invention except for reciting first and second electrodes extending on one side of the thermistor.

Hori et al teaches in Figure 6 the first and second electrodes (7, 8) extending on one side of the thermistor.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the electrodes extending on one side of the thermistor, as taught by Hori et al, for the purpose of obtaining and controlling varied temperature as noted in column 1, lines 7-15 of Hori et al.

Allowable Subject Matter

9. Claims 6-11, 13-15, 21-28, 38 and 39 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 6, it is the limitation of "the first and second edges extend in a direction which is substantially perpendicular to the plurality of the ink channels," which was not found, taught or suggested by the prior arts.

Regarding claims 13 and 26, it is the limitations of "wherein the main body portion includes a recess and first and second grooves extending in a longitudinal direction from the recess, and wherein the recess receives the thermistor material and the first and second grooves receive the first and second leads, respectively," which were not found, taught or suggested by the prior arts.

Response to Arguments

11. Applicant's arguments filed 13 November 2003 have been fully considered but they are not persuasive. Applicant argued that the PTC thermistor in Suzuki et al are PERPENDICULAR, not parallel as claimed in claimed invention, to the horizontal plane of the ink channels. However, this argument is not persuasive since the Examiner further defines the ink chambers are spaces between the thermistors (14) of the body portion (11) as shown in Figure 2. Also, by looking at Figure 2 lengthwise, the PTC thermistors (14) are parallel to the common plane.

Contact Information

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to An H. Do whose telephone number is 703-308-0525. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen D. Meier can be reached on 703-308-4896. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'An H. Do', with a long horizontal flourish extending to the right.

An H. Do
February 6, 2004